ABSTRACT

A new reversible element with six lines (three input lines and three output lines) and two states are proposed. This element is computationally universal in the sense that a universal Turing machine can be constructed from it. Two reversible elements, each of which has two input lines, two output lines, and two states. These two elements are related to each other in the sense that their functionalities are each other's inverse, so, one of the elements can be obtained from the other by reversing the operations conducted by the other, and interpreting the other's input lines as output lines and the other's output lines as input lines. Together these two elements form a computationally universal set, i.e., a universal Turing machine can be constructed from them.